

Answers – Basic algebra

PAGE 1 1 a 11x b 16x c 16x d 27x e 41x f 45x g 14xy h 20mn i 38a j 18x k 42a² l 19p 2 a 4a b 8a c 5a d 15x e 7m f 4y g 6x h 2xy i 22x² j 8y k 5x l 11p 3 a 12a b 8x c 14a d 14a e 20xy f 8mn g 9x² h 13a² i 5x j 16t k 10m l 12a 4 a 3x + 5y b 9a + 11b c 5m + 2n d 4x² e 2a + 5b f 14a - 6b g 15y - 7x h 6xy 5 a 22 - 10x b 3m + 3n c 19x - 2y d 11x² - 7y² e 8m + 2n f 6xy + 6yz g 9a + 6b h 3a + 6b i 6t + 3 j 18ab

PAGE 2 1 a 10a b 18b c 72y d 21y e -6ab f 6a g -3ab h 6ab i 18x j -45a²b k 16a² l 12x² 2 a 18ab b 6x² c 40xy d 24y² e 27ab f -30a² g 48y² h 6t² i 54x²y j -30a²b 3 a 2a²b b 90a c 30a²bc d a²b²c² e -54ab²c f 42a²p g -40x h 6xy² 4 a 40ab b 14k² c -72x²y² d 8a³x² e 36m² f 24m²t g 3y³ h -30x² 5 a -8a²b² b -84a² c -18x²y d 30abc e -4a²b f -x²y g 25p² h -36a²

PAGE 3 1 a 3a b 3pq c $\frac{4}{5m}$ d 3x e 3y f 6a g 2a h 9x i $\frac{3}{y}$ 2 a 3 b 4y c 3n d 8m e -x f 8b g 4 h 8a i 4y j -3b k 3b l 4x 3 a -3x b -2b c 2y d 3x e 3y f 4 g 4x² h 12y i -5q j 10n 4 a -4 b 17 c -8x d -2 e 2x f 6m g 5y h 8b 5 a -4b b 4x c -1 d 9y e 1 f $\frac{ab}{c}$ g $\frac{3}{b}$ h 2x

PAGE 4 1 a 16a² b 60a²c c 15a² d 288a⁴ e -27x² f -36a³ g 45x³y h 15y³ i 96a²b j 72a³ k 3a⁴b l 9a³b³ 2 a 5 b 9 c 6 d 25 e -2q f -7x g -4b h -4a i 4p j 4yz k 5 l -9n 3 a -9 b $\frac{-5b}{a}$ c -1 d 7abc e 3

f 7t g 4y h -5b i $\frac{5}{2}$ j -5a 4 a -15a² b 40abc c -56x² d 48a³ e -30a²b f -40x²y g 36a³b² h -a⁴b⁴ i 8xy³

j -15x²y 5 a 6 b 12 c $\frac{10}{3}$ d 4b² e 6ab f -x

PAGE 5 1 a a⁵ b 6p⁵ c y¹¹ d m⁷ e 32a⁸ f x¹⁵ g x¹² h 72a⁹ i 80p¹¹ j x²⁰ k a⁷b⁷ l 36x⁷y⁵ 2 a a⁴ b 4m² c 4ab d a⁸ e k⁵ f 2a²b⁵ g a¹² h 4a² i -9x¹⁰y j m⁷ k m²n² l 8a²b² 3 a a⁶ b y²⁰ c 64x⁴y⁶ d m¹⁰ e x²¹ f 729a³b⁶ g x²⁴ h 64a⁶ i 125m¹² j a⁴² k 81p⁴ l 1000a⁹b⁹ 4 a 1 b 1 c 9 d 1 e 1 f 2 g 1 h 1 i 1

5 a x⁷ b p⁴q c a¹⁴ d m⁹ e 64p⁴ f x⁶ g 30x⁵ h 9m⁹n i 3x³ 6 a 12a¹² b 2ab⁴ c a² d 9a e $\frac{4a^2}{b^2}$ f 45a²b² g x³ h a⁶b³ i 4xy

PAGE 6 1 a 3x + 3y b 10a + 15b c 8a + 12 d 48a - 42b e 8m + 24p f 15a - 12m g 5x² + 40x h 7x - 35 i 9a² - 18ab j 24x - 36 k 12am + 6mn l 45x - 105 2 a -3x - 6 b -10x² - 5x c -4x + 14 d -16x² + 6xy e -12x + 15 f -xy - y³ g -64x + 72 h -3m² - 8m i -2x² - 2x j -16n + 10mn k -6x² - 15x l -12t² + 18t 3 a 10x + 35 b 21x - 77 c -12x + 27 d -8x - 20 e 48y + 24 f -15a² - 15a g -2x² - 7x h -8m² + 5m i -6t² - 10t j 16a² + 24ab k -24x² + 40x l 12p² - 18mp 4 a 7x + 6 b 11y + 17 c 2xy - 35 d p - 70 e 2y² + 12y f 5x + 6 g 12p - 24 h 9m - 16 i 8m² + 9m j 4x - 26 k 5t - 24 l 3x + 54 5 a 6m + 14 b 2x + 18 c 19x + 62 d 8x + 76 e 3y + 37 f 17x + 24 g 5n - 32 h 2x² - 3

PAGE 7 1 a 28 b 336 c 2 $\frac{1}{3}$ d 784 e 4032 f 209 g 23 h 37 i -11 j 71 k 1316 l 380 2 a 27 b 1 c 7 d 69 e 96 f 88 g 50 h 64 i 3 j 45 k 48 l -33 3 a 10.7 b 17.1 c 34.2 d 23.1 e 114.5 f 483.8 g 425.1 h 5.0 i 0.2 j 4.1 k 8.8 l 3.9 4 a 138 b 50 c 360 d -18 e 32 f 11 g 212 h -5 i 30

PAGE 8 1 a 7(x + 1) b 2(5a - 1) c 7(y + 2) d 4(2x - 1) e 3(a + 5) f 4(x - 3y) g 3(y + 1) h 5(m + 6) i 4(8x - 7) j 5(a - 1) k 2(3a - b) l 5(a + 7) 2 a y(y + 3) b 3y²(2y - 1) c 3x²(2x - 1) d 2m(m + 3) e 4a(2a - 1) f m(m - 9) g 8a(a + 3) h 3y(5y - 2) i 8a(2a - 1) j x(x + 9) k 3a²(3a - 2) l 7x(4x - 1) 3 a -3(x + 1) b -4(y² - 4) c -3(2n + 1) d -5(x + 8) e -3(x - 9) f -7(t + 2) g -2(m² + 2) h -5(m² - 7) i -11(x² + 2) j -6(a² - 2) k -8(a² + 4) l -13(y - 3) 4 a -6x(x + 2) b -4x(4x + 1) c -3(2x + 3) d -4y(2x + 1) e -9x²(x - 3) f -5x(3x + y) g -3(2mn + 1) h -5xy(xy - 5) i -3m(2n - 5m) j -4xy(2z - 1) k -3x(3x + 5) l -x(1 + 3y) 5 a 8(a + 2b) b 5(a - 5) c 4(2x - y) d 9(a - b) e 8(1 - t) f m²(m - 4) g a(16b - a) h 7(2m - 1) i 8ab(2 - a) j 5xy(3xy - 1) k -6(m + 6) l -4(m + 3n) 6 a 3(a + b + c) b p(16q - 7) c -x(x + 7) d 8(x + y - 2z) e x(t - 1) f 5(3a + b - 2c) g 4(x - 2y) h y²(y - 1) i 3(6x - 3y + 2) j 16(x - 2y) k 3n(5m - 1) l 3(2a² + a + 3) m m(m - 2n) n q(8p - q) o -6(x + xy + 2)

PAGE 9 1 a $\frac{x}{4}$ b x c $\frac{17x}{15}$ d $\frac{2a}{9}$ e $\frac{2x}{7}$ f $\frac{y}{3}$ g $\frac{7x}{12}$ h $\frac{25a}{63}$ i $\frac{13a}{14}$ j $\frac{46x}{35}$ k $\frac{11m}{9}$ l $\frac{29a}{35}$ 2 a $\frac{a}{3}$ b $\frac{2x}{7}$ c $\frac{10y}{11}$ d $\frac{4m}{13}$ e $\frac{p}{12}$ f $\frac{x}{3}$ g $\frac{4x}{21}$ h $\frac{x}{24}$ i $\frac{y}{36}$ j $\frac{x}{20}$ k $\frac{3a+2}{14}$ l $\frac{14x+3}{12}$ 3 a $\frac{19x}{6}$ b $\frac{x}{20}$ c $\frac{3x}{4}$ d $\frac{-x}{8}$ e $\frac{4x}{3}$ f $\frac{2x}{3}$ g $\frac{5x}{9}$ h $\frac{19x}{24}$ i $\frac{37x}{50}$ j $\frac{13x}{72}$ k $\frac{7x}{16}$ l $\frac{71m}{50}$ 4 a $\frac{5p}{9}$ b $\frac{45y}{8}$ c $\frac{17a}{30}$ d $\frac{19x}{30}$ e $\frac{19a}{14}$ f $\frac{5m}{6}$ g $\frac{31x}{45}$ h $\frac{95m}{16}$

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PAGE 10 1 a $\frac{a^2}{12}$ b $\frac{xy}{30}$ c $\frac{m^2}{6}$ d $\frac{p^2}{32}$ e $\frac{a}{2x}$ f $\frac{3n}{m}$ g $12\frac{1}{2}$ h $\frac{5}{x}$ i $\frac{1}{2x}$ j $\frac{2y}{3}$ k $\frac{4}{a}$ l $\frac{1}{5x}$ 2 a $\frac{5}{2}$ b $\frac{2}{3}$
c $\frac{15}{64}$ d $\frac{5}{6}$ e $\frac{5}{16}$ f $\frac{a^2}{10}$ g $\frac{2b}{a}$ h $3xy$ i 2 j $\frac{5}{14}$ k $\frac{18}{55}$ l $\frac{3b}{c}$ 3 a $\frac{7x^2}{20}$ b 1 c $\frac{a^2}{b^2}$ d $\frac{27}{20}$ e $\frac{2}{3}$ f $\frac{l}{n}$ g $\frac{15}{8}$
h $\frac{25}{24a}$ i 1 j $\frac{3y}{4}$ k $2a$ l $\frac{x}{y}$ 4 a $\frac{8n}{m}$ b $\frac{4}{m^2}$ c $\frac{c}{2}$ d $\frac{4}{9}$ e $\frac{2}{mp}$ f $\frac{3y}{4}$ g $\frac{b}{a}$ h $\frac{c}{a^2b}$ i $\frac{12}{xy}$
PAGE 11 1 $8x + 4$ 2 $12x$ 3 $12x + 10$ 4 $5x^2 + 7x$ 5 $9x^2$ 6 $6x^2 - 10x$ 7 $3x + 5y$ 8 $40mn$ 9 $5x$ 10 $2x + 8$ 11 $y^2 \text{ m}^2$
12 $4x + 1$ 13 $7x + 10$ 14 $8x^3 \text{ cm}^3$ 15 $3x + 5y + 2$
PAGES 12 & 13 1 A 2 D 3 A 4 D 5 B 6 D 7 A 8 C 9 D 10 D 11 B 12 D 13 B 14 C 15 C
PAGE 14 1 $-2y$ 2 $6a^3$ 3 $7(x + 2y)$ 4 $x = 44$ 5 $6x^2 - 15xy$ 6 5 7 $6x$ 8 $9a^4b^2$ 9 $7x$ 10 $24m^3$ 11 $\frac{5a}{9}$ 12 $\frac{4x+5}{4}$
13 3 14 8 15 $7a + 8b - 12$
PAGE 15 1 a 48 b -40 c 160 d -36 e -16 2 a $3a$ b $a + 15$ c $-15a - 24b$ d $\frac{4}{a}$ e $\frac{31x}{35}$ 3 a $6x - 15$ b x
c $8 - x$ d $-3x + 6y$ e $-4a - 14b$ 4 a $x(3 - x)$ b $3pq(p + 4q)$ c $x = 3$ d $5p^3q^6$ e $\frac{3ab}{10}$